

# STRATEGIC PLAN

## The NOAA Strategic Plan

### *An FY 1998 Budgetary Overview*

#### **Vision**

*For the year 2005, NOAA envisions a world in which societal and economic decisions are coupled strongly with a comprehensive understanding of the environment. Environmental stewardship, assessment and prediction will serve as keystones to enhancing economic prosperity and the quality of life, better protecting lives and property, and strengthening the U.S. balance of trade. This vision depends on actions now that:*

- ❖ Create and disseminate reliable assessments and predictions of weather, climate, space environment, ocean and living marine resources, nautical, aeronautical and geodetic phenomena and systems.
- ❖ Implement integrated approaches to environmental management and ocean and coastal resources development for economic and social health, protection of essential fish habitat, and recovery of endangered and threatened species of fish and marine mammals.
- ❖ Ensure continuous operational observing capabilities—from satellites to ships to radars to data buoys.
- ❖ Build and use new information networks.
- ❖ Develop public-private and international partnerships for the expansion and transfer of environmental knowledge and technologies.
- ❖ Invest in scientific research and the development of new technologies to improve current operations and prepare for the future.
- ❖ Improve NOAA's abilities to serve its customers and forge stronger ties with its partners and stakeholders.

#### **Achieving NOAA's Vision for 2005**

NOAA's Strategic Plan for 1995-2005 describes the goals and objectives that have been established to fulfill its vision. The strategy consists of seven inter-related goals that are grouped within the two missions of *Environmental Assessment and Prediction* and *Environmental Stewardship*. The execution of NOAA's goal-based strategy depends strongly on a stable infrastructure and administrative and human resources, as well as on the underlying capabilities of the agency as a national resource for research, observing systems, and environmental data and information services.

NOAA's FY 1998 budgetary overview by strategic goal follows. Systematic, cross-cutting measures of performance are provided as indicators of expected progress for the proposed levels of investment. Resource charts and tables provide a convenient crosswalk between the goal-based budget request and the traditional activity-based budget.

# Advance Short-Term Warning and Forecast Services

Total Request \$1,178,434,000

## Vision

NOAA's vision for 2005 is to provide significantly improved short-term warning and forecast products and services that enhance public safety and the economic productivity of the Nation. NOAA will enhance its ability to observe, understand, and model the environment, and effectively disseminate products and services to users.

## Challenge

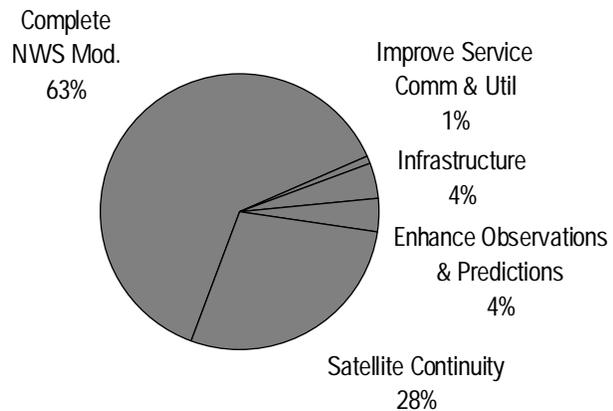
Our environment has profound effects on human welfare and economic well being. Each year, hundreds of lives and billions of dollars are lost due to severe storms, floods and other natural events that could be predicted minutes to months in advance. NOAA's current ability to predict short-term change is restricted by observations that are incomplete in time and space. This limits the ability to improve basic understanding, and predictive modeling of weather and other natural phenomena. NOAA must improve its observing systems, develop a better understanding of natural processes, and enhance predictive models and dissemination systems.

## Implementation Strategy

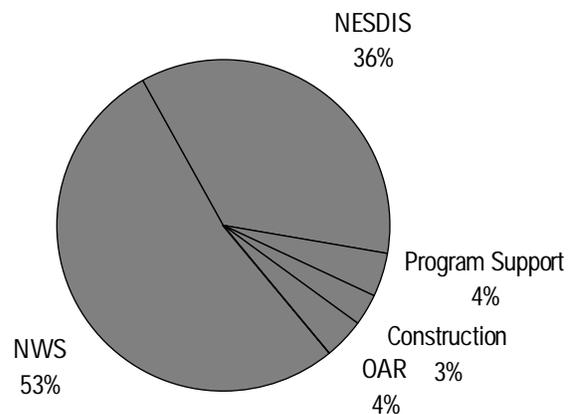
Objectives of this goal are to:

- ❖ Complete the modernization and restructuring of the National Weather Service (NWS) and ensure continuation of services to the public.
- ❖ Maintain continuous operational satellite coverage critical for warnings and forecasts.
- ❖ Strengthen observing and prediction systems through scientific, technological and programmatic advances, and international cooperation. This objective will be achieved in cooperation with the U.S. Weather Research Program (USWRP) by incorporating the scientific and technologic advances from the USWRP into service improvements.

## Strategic Plan Objectives



## Participation by Activity



- ❖ Improve customer service to the public, emergency managers, the media and private forecast planners through effective communication and utilization of NOAA's products.

### **Benefits**

Increasing our understanding of the environment through research and investing in new technologies will provide more accurate and timely weather warnings and forecasts required by the Nation. Improved forecasts will support management of water resources, and help avoid flood damage. Extended forecasts of solar and geomagnetic disturbances will increase efficiencies for space operations, and power generation and satellite communications networks. Advanced modeling techniques and more complete observations will reduce uncertainties in hurricane track prediction, saving millions of dollars through evacuation costs avoided. Accurate outlooks of future conditions will provide better information for planning weather sensitive activities over land and ocean.

### **FY 1996 Accomplishments**

The Nation continued to experience the benefits of weather service modernization during FY 1996. The NWS installed an additional 19 NEXRAD radars, 28 Automated Surface Observing Systems, and 13 Advanced Weather Interactive Processing Systems. Full Stage I staffing was completed at an additional nineteen Weather Forecast Offices (WFOs), while four new WFO facilities were built or leased. With the launch and positioning of GOES-9, the country now has two advanced geostationary weather satellites providing complete coverage of the U.S. The National Weather Service modernization led to significant improvements in the accuracy and timeliness of warnings and forecasts of severe weather events in FY 1996. These improvements can be directly attributed to saving lives and reducing the effects of natural disasters. For example:

- ❖ The NWS issued three- to five-day advance forecasts of the east coast blizzard of 1996. Acting on this information, emergency officials in Virginia declared a state of emergency before the first flakes fell, while United Airlines canceled all flights and moved its aircraft out of the east before the storm hit.
- ❖ During Hurricane Fran, the NWS issued warnings 31 hours before landfall; flood potential statements two to three days in advance as the storm headed north; and provided six hours of lead time for flash flooding.
- ❖ NOAA's Geophysical Fluid Dynamics Laboratory (GFDL) hurricane model, implemented in 1995, continued to provide excellent guidance to hurricane forecasters, and has outperformed other track models.
- ❖ The number of tornadoes through the end of 1996 exceeded that in a typical year. However, the number of lives lost as a result of these storms was well

below that during a normal year. With new technologies, NWS forecasters issued numerous warnings with lead-times in excess of 15 minutes, minimizing the loss of life.

### **Key FY 1998 Activities**

- ❖ Conduct an examination of modernized technologies and their potential future uses in all economic sectors.
- ❖ Assess the upper air network to determine the best-mix of cost-effective observing systems to operate in the future.
- ❖ Continue deployment of the Advanced Weather Interactive Processing Systems (AWIPS).
- ❖ Initiate procurement process for the Class VIII supercomputer.
- ❖ Continue the procurement, launching, and operation of polar orbiting satellites and the follow-on series of geostationary weather satellites.
- ❖ Improve high resolution hurricane forecasting models by providing additional flight hours and dropsondes associated with the new high altitude jet.

**Key Performance Measures**

|   | 1994 | 1995 | 1996 | 1997 | 1998 |
|---|------|------|------|------|------|
| <b>Flash Flood Warning:</b>                       |      |      |      |      |      |
| Lead time (min)                                   | 17   | 17   | 21   | 27   | 30   |
| Accuracy (%)                                      | 58   | 58   | 63   | 74   | 78   |
| No lead time (%)                                  | 64   | 64   | 58   | 40   | 35   |
| <b>Severe Thunderstorm Warnings:</b>              |      |      |      |      |      |
| Lead time (min)                                   | 15   | 15   | 18   | 18   | 18   |
| Accuracy (%)                                      | 73   | 75   | 80   | 82   | 83   |
| <b>Tornado Warnings:</b>                          |      |      |      |      |      |
| Lead time (min)                                   | 8    | 9    | 11   | 11   | 12   |
| Accuracy (%)                                      | 53   | 60   | 64   | 66   | 68   |
| <b>Hurricane Landfall Warnings:</b>               |      |      |      |      |      |
| Accuracy of Landfall (km)<br>w/ 24 hour lead time | 185  | 135  | 130  | 145  | 135  |
| <b>Temperature:</b>                               |      |      |      |      |      |
| Correct forecasts (%)                             | 82   | 84   | 85   | 86   | 86   |
| Correct onset freezing (%)                        | 68   | 72   | 74   | 76   | 77   |
| <b>Precipitation Forecasts:</b>                   |      |      |      |      |      |
| Lead time (days advance)                          | 2.2  | 2.3  | 2.3  | 2.3  | 2.3  |
| <b>Snow Forecasts:</b>                            |      |      |      |      |      |
| Accuracy heavy snow (%)                           | 39   | 42   | 44   | 45   | 50   |
| <b>Coastal Winds Forecast Improvements</b>        |      |      |      |      |      |
| Lead time (hours)                                 | 48   | 48   | 48   | 48   | 48   |
| Accuracy (meters/sec)                             | 2.5  | 2.5  | 2.5  | 2.5  | 2.5  |
| Resolution (km)                                   | 80   | 80   | 80   | 80   | 80   |

| <i>Dollars in Thousands</i>                                   | Current Avail.<br>FY 1997 |                  | FY 1998 Pres. Req. |                  | Increase/Decrease |               |
|---|---------------------------|------------------|--------------------|------------------|-------------------|---------------|
|   | FTE                       | Amount           | FTE                | Amount           | FTE               | Amount        |
| <b>ACTIVITY REQUEST</b>                                       |                           |                  |                    |                  |                   |               |
| <b>Advance Short-Term Warning and Forecast Services</b>       |                           |                  |                    |                  |                   |               |
| National Ocean Service  | 0                         | 150              | 0                  | 150              | 0                 | 0             |
| Oceanic and Atmospheric Research                              | 296                       | 51,954           | 296                | 49,579           | 0                 | (2,375)       |
| National Weather Service                                      | 5,090                     | 623,244          | 4,785              | 629,577          | (305)             | 6,333         |
| National Environmental Satellite, Data & Information Service  | 541                       | 399,865          | 541                | 423,513          | 0                 | 23,648        |
| Program Support   | 722                       | 42,742           | 722                | 43,256           | 0                 | 514           |
| Construction  | 7                         | 21,528           | 7                  | 32,359           | 0                 | 10,831        |
| <b>Total Advance Short-Term Warning and Forecast Services</b> | <b>6,656</b>              | <b>1,139,483</b> | <b>6,351</b>       | <b>1,178,434</b> | <b>(305)</b>      | <b>38,951</b> |

| <i>Dollars in Thousands</i>                                   | Current Avail.<br>FY 1997 |                  | FY 1998 Pres. Req. |                  | Increase/Decrease |               |
|---|---------------------------|------------------|--------------------|------------------|-------------------|---------------|
|   | FTE                       | Amount           | FTE                | Amount           | FTE               | Amount        |
| <b>GOAL BASED</b>   |                           |                  |                    |                  |                   |               |
| <b>Advance Short-Term Warning and Forecast Services</b>       |                           |                  |                    |                  |                   |               |
| Complete NWS Modernization                                    | 5,146                     | 712,420          | 4,841              | 737,491          | (305)             | 25,071        |
| Satellite Continuity  | 525                       | 323,686          | 525                | 333,659          | 0                 | 9,973         |
| Enhance Observations & Predictions                            | 338                       | 55,019           | 338                | 52,049           | 0                 | (2,970)       |
| Improve Service Communication and Utilization                 | 21                        | 2,642            | 21                 | 2,642            | 0                 | 0             |
| Infrastructure  | 626                       | 45,716           | 626                | 52,593           | 0                 | 6,877         |
| <b>Total Advance Short-Term Warning and Forecast Services</b> | <b>6,656</b>              | <b>1,139,483</b> | <b>6,351</b>       | <b>1,178,434</b> | <b>(305)</b>      | <b>38,951</b> |



# Implement Seasonal to Interannual Climate Forecasts

Total Request \$115,263,000

## Vision

NOAA, working together with academic and multinational partners, will provide one-year lead-time forecasts of known skill of global climate variability, especially El Niño and the consequent precipitation and surface temperature distributions. These forecasts will increase society's ability to mitigate economic losses and social disruption.

## Challenge

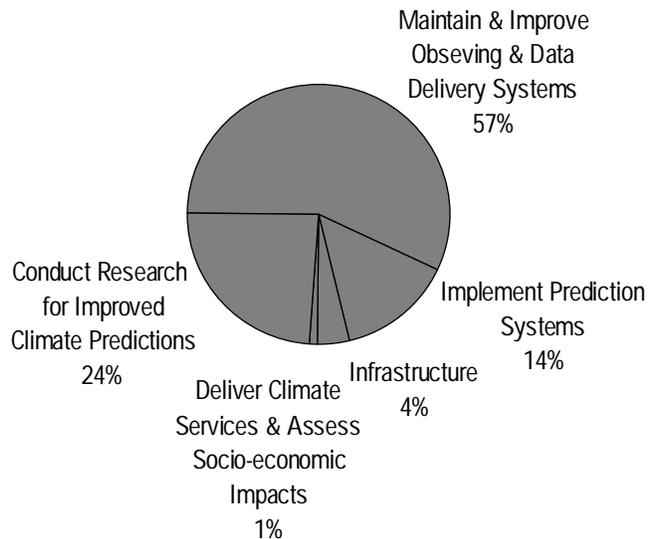
The largest interannual climate variability that has a degree of predictability is caused by the El Niño-Southern Oscillation (ENSO) phenomenon in the Pacific Ocean. Temperature and precipitation patterns, changes in ocean circulation, and changes in storm frequency caused by ENSO have global effects on economies and planning. Based on the application of ENSO-related research, NOAA has begun issuing monthly and seasonal probability outlooks for temperature and rainfall for up to a year in advance. The challenge is to introduce an operational program for the systematic production and application of regionally tailored climate forecasts. Planned actions represent an end-to-end integrated approach to establishing such a system, including the multinational infrastructure needed to generate and transfer useful climate information and forecasts.

## Implementation Strategy

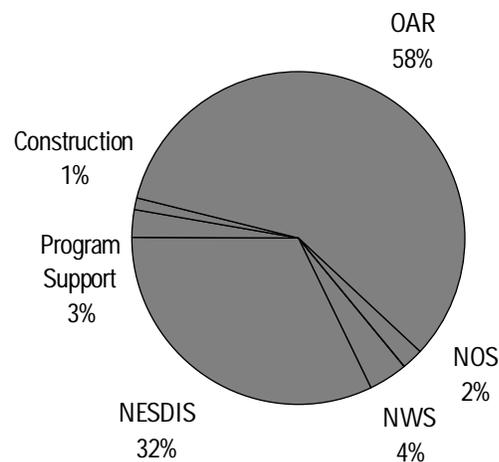
Objectives of this goal are to:

- ❖ Deliver useful seasonal to interannual climate forecasts for the U.S. and collaborate in a multinational effort to generate and use similar forecasts.
- ❖ Enhance global observing and data systems required to provide data for the initialization and validation of model predictions of seasonal to interannual climate variations.

## Strategic Plan Objectives



## Participation by Activity



- ❖ Invest in process and modeling research that leads to improved predictability of temperature and rainfall distributions.
- ❖ Assess the impacts of climate variability on human activity and economic potential, and improve public education so that climate forecasts are understood and acted upon.

### **Benefits**

We can now predict El Niño events to a level of skill and with enough lead time that hundreds of millions of dollars a year could be saved in the U.S. economy and abroad. ENSO forecasts will improve fisheries management, as warm ENSO events have been associated with reduced marine catches. Global forecasts of climate variability will enhance agricultural, water resources, and other economic and social response planning. These forecasts will be a major contribution to U.S. commitments to the United Nations Conference on Environment and Development (UNCED).

### **FY 1996 Accomplishments**

During FY 1996, NOAA continued to work toward the establishment of an International Research Institute (IRI) and associated Applied Research Center to provide for capabilities for climate forecasting and applications and for facilitating the transition from ENSO forecasting to operations. Key accomplishments across the four objectives supporting this strategic goal include:

- ❖ Developing and implementing an improved version of the coupled forecast model for ENSO at the National Centers for Environmental Prediction (NCEP), resulting in skill improvements over the entire record from 1981 to present.
- ❖ Developing the methodology for making direct probabilistic seasonal forecasts of rainfall and temperature variability over North America using atmospheric general circulation model simulations and forecasts.
- ❖ Successfully predicting, six months in advance, a recent cold event in the tropical Pacific utilizing Global Circulation Models.
- ❖ Upgrading data sets with climate quality observations and beginning a four-year project to evolve the Tropical Oceans Global Atmosphere (TOGA) Observing System from research to operations in support of routine ENSO predictions.
- ❖ Implementing modeling and diagnostic projects within the context of GOALS (Global Ocean-Atmosphere-Land System) and GEWEX (Global Energy and Water Cycle Experiment) to improve modeling of the influence of the global upper oceans, land moisture, vegetation, snow and sea ice on seasonally varying climate. GOALS projects have facilitated investigation of the interdecadal modulation of ENSO.

- ❖ Conducting socio-economic impacts research on the value of ENSO forecasting for agriculture planning in Texas, land use decisions in the western U.S., and management of fisheries in the Pacific Northwest.

### **Key FY 1998 Activities**

**Develop Operational ENSO Observations.** Transition the eastern Pacific TOGA buoy network to operations while maintaining the research base. This initiative seeks support for the combination of in-situ measurements proven to be essential for operational ENSO forecasting when jointly used with remotely sensed parameters and global models. Virtual Laboratory activities will determine the blend of measurement types and arrays. This observing system was determined by the National Academy of Sciences to be the highest priority for continuation to support seasonal-to-interannual predictions.

**Operational Forecast Prediction System.** Improve dynamical seasonal prediction activities at NCEP, automate the production of climate forecasts, and deliver forecast and monitoring products.

**International Research Institute.** NOAA's participation in a multinational planning process for an IRI will culminate in the signing of an agreement establishing the Institute designed to develop and distribute experimental climate predictions multinationally, conduct modeling and applications research and development, and continue training in techniques employed in climate modeling and forecasts development, interpretation and application.

**Research for Improved Climate Predictions.** Continue research to improve seasonal-to-interannual predictions, and expand efforts beyond the initial focus on predictability in the tropical Pacific to examine the impacts of other oceans and land surface processes through investments in the GOALS and GEWEX programs.

**Satellite Active Archive.** Make basic improvements in accessing, storing and retrieving data. The Satellite Active Archive initiative will also provide funding to develop interoperability with the Earth Observing System Data and Information System (EOSDIS) and to add a data reprocessing capability.

**NOAA Virtual Data System (NVDS).** Continue to work to link NESDIS data centers and other NOAA centers of data and consolidate information technology functions via an NVDS. NVDS will be based on a high volume of data requests upon the 400 terabyte data archive. The data archive will be easily accessible to the user community through the Internet or by request.

**Deliver Climate Services.** Provide dependable delivery of climate services, defined as providing climate predictions, products, and information to users for applications that guide sustainable development, reduce commercial risk, and

achieve social benefits. In addition, an organized program of research on socio-economic impacts and vulnerabilities and assessments to provide policy-relevant information will maximize economic and social benefits.

| <b>Key Performance Measures</b>                                    |      |      |      |      |      |
|--|------|------|------|------|------|
|  | 1994 | 1995 | 1996 | 1997 | 1998 |
| <b>Dynamic forecast model operational (%)</b>                      | 25   | 50   | 50   | 50   | 55   |
| <b>ENSO Forecasts</b>  |      |      |      |      |      |
| Accuracy (correlation)*  | .80  | .76  | .85  | .85  | .85  |
| Lead time (years)†   | .50  | .50  | .50  | .50  | .50  |
| <b>U.S. Temperature/Precipitation</b>                              |      |      |      |      |      |
| Skill score (%)§   | 12   | 11   | 11   | 13   | 15   |
| Lead time (years)  | .25  | .50  | .50  | .50  | .50  |
| <b>TOGA observing system operational (%)</b>                       | -    | -    | 0    | 25   | 25   |
| <b>New and Improved data sets developed and produced (#)</b>       | -    | -    | 7    | 7    | 7    |
| <b>Continental Scale Int'l Project experiments implemented (%)</b> | -    | -    | 20   | 40   | 60   |
| <b>GOALS experiments implemented (%)</b>                           | -    | -    | 5    | 15   | 20   |

\* Accuracy is the pattern correlation of the forecast relative to actual conditions.

† Lead time is measured in years (e.g., 0.25 is one season).

§ Skill score means 100 times the number of correct forecasts made (N), with adjustments for those cases where the actual conditions are equal to the climatological or random-choice expectation (E).

| <i>Dollars in Thousands</i>                                     | Current Avail.<br>FY 1997 |                | FY 1998 Pres. Req. |                | Increase/Decrease |              |
|---|---------------------------|----------------|--------------------|----------------|-------------------|--------------|
|   | FTE                       | Amount         | FTE                | Amount         | FTE               | Amount       |
| <b>ACTIVITY REQUEST</b>   |                           |                |                    |                |                   |              |
| <b>Implement Seasonal to Interannual Climate Forecast</b>       |                           |                |                    |                |                   |              |
| National Ocean Service  | 0                         | 2,500          | 0                  | 2,800          | 0                 | 300          |
| Oceanic and Atmospheric Research                                | 289                       | 60,609         | 289                | 66,776         | 0                 | 6,167        |
| National Weather Service  | 54                        | 6,564          | 54                 | 4,688          | 0                 | (1,876)      |
| National Environmental Satellite, Data & Information Service    | 266                       | 38,175         | 266                | 37,208         | 0                 | (967)        |
| Program Support   | 56                        | 3,265          | 56                 | 3,300          | 0                 | 35           |
| Construction  | 1                         | 1,099          | 1                  | 491            | 0                 | (608)        |
| <b>Total Implement Seasonal to Interannual Climate Forecast</b> | <b>666</b>                | <b>112,212</b> | <b>666</b>         | <b>115,263</b> | <b>0</b>          | <b>3,051</b> |

| <i>Dollars in Thousands</i>                                     | Current Avail.<br>FY 1997 |                | FY 1998 Pres. Req. |                | Increase/Decrease |              |
|---|---------------------------|----------------|--------------------|----------------|-------------------|--------------|
|   | FTE                       | Amount         | FTE                | Amount         | FTE               | Amount       |
| <b>GOAL BASED</b>   |                           |                |                    |                |                   |              |
| <b>Implement Seasonal to Interannual Climate Forecast</b>       |                           |                |                    |                |                   |              |
| Implement Prediction Systems                                    | 73                        | 17,292         | 73                 | 15,773         | 0                 | (1,519)      |
| Maintain and Improve Observing and Data Delivery Systems        | 429                       | 60,903         | 429                | 65,534         | 0                 | 4,631        |
| Conduct Research for Improved Climate Predictions               | 109                       | 27,957         | 109                | 28,445         | 0                 | 488          |
| Deliver Climate Services and Assess Socio-economic Impacts      | 0                         | 1,022          | 0                  | 1,036          | 0                 | 14           |
| Infrastructure  | 55                        | 5,038          | 55                 | 4,475          | 0                 | (563)        |
| <b>Total Implement Seasonal to Interannual Climate Forecast</b> | <b>666</b>                | <b>112,212</b> | <b>666</b>         | <b>115,263</b> | <b>0</b>          | <b>3,051</b> |



# Predict and Assess Decadal to Centennial Change

Total Request \$90,630,000

## Vision

NOAA will provide science-based information for decisions regarding decadal-to-centennial changes in the global environment, specifically for: climate change and greenhouse warming; ozone layer depletion; and air quality improvement.

## Challenge

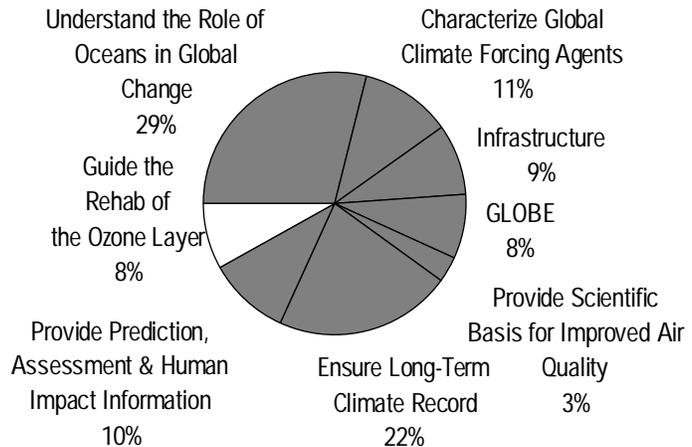
Our planet is naturally a place of change, often with severe impacts on humans. Human activities now are inducing additional changes, including atmospheric pollution and thinning of the stratospheric ozone layer. These changes create critical prediction and assessment needs for the world community. Global models providing predictions must be strengthened through a better understanding of the atmospheric and oceanic processes involved in global changes and through improvements in global observing systems. The challenge is to understand and foresee the natural and human-induced variations of the approaching few decades in order to make sound economic and social decisions.

## Implementation Strategy

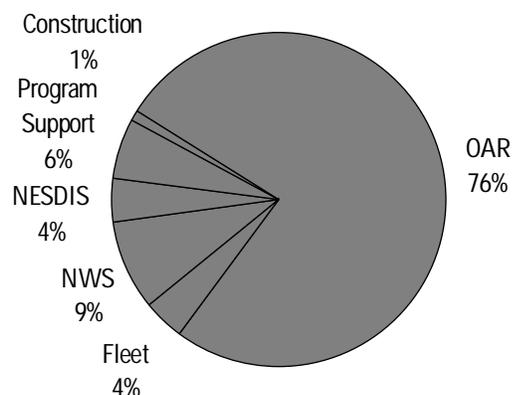
Objectives of this goal are to:

- ❖ Characterize the agents and processes that force decadal to centennial climate change.
- ❖ Examine the role of the ocean as a reservoir of both heat and carbon dioxide to address a major source of uncertainty in climate models.
- ❖ Ensure a long-term climate record by enhancing domestic and international weather networks, observing procedures, and information management systems.
- ❖ Guide the rehabilitation of the ozone layer by providing the scientific basis for policy choices associated with ozone-depleting compounds.

Strategic Plan Objectives



Participation by Activity



- ❖ Provide the scientific basis for better air quality by improving the understanding of high surface ozone episodes in rural areas and by establishing a monitoring network to detect cleaner air quality.
- ❖ Develop models for the prediction of long-term climate change, carry out scientific assessments, and provide human impacts information.

### **Benefits**

The nations have committed to eliminating production of compounds that deplete the ozone layer. Research is not only helping to define the ozone-friendly replacement compounds, but also to document that the recovery of the ozone layer is as expected. Anticipatory research on global climate change supports sustainable development by providing timely information to society to make sound decisions to mitigate against or adapt to changes that require several decades to reverse once underway. The U.S. Clean Air Act Amendments of 1990 requires pollutant emission reductions to improve the Nation's air quality. New research is pointing to more effective ways to meet those goals, thereby avoiding costly over-regulation. Providing research results that address key scientific uncertainties, presenting the improvements in understanding in up-to-date assessments, and summarizing this knowledge in policy-relevant terms to government and industrial leaders are the cornerstones of environmental stewardship.

### **FY 1996 Accomplishments**

NOAA continues to make progress in understanding and documenting decadal-to-centennial changes. NOAA is providing major scientific input and leadership to the Intergovernmental Panel on Climate Change (IPCC), the World Meteorological Organization (WMO), the United Nations Environment Programme (UNEP), and the newly formed North American Research Strategy for Tropospheric Ozone (NARSTO). NOAA efforts in FY 1996 have:

- ❖ Documented a decrease in tropospheric levels of an ozone-depleting substance, a first-time observation that demonstrates the emerging effectiveness of the Montreal Protocol.
- ❖ Demonstrated the influences of anthropogenic and natural emissions on the production of surface-level ozone pollution in the southeastern U.S. and determined that air quality issues are regional, rather than local.
- ❖ Led U.S. efforts to organize the first assessment of policy-relevant air quality scientific findings for the U.S. as part of NARSTO.
- ❖ Obtained a more realistic estimate of the transient response of climate to increasing greenhouse gases and atmospheric aerosols by use of a coupled ocean-atmosphere model with higher computational resolution.

- ❖ Completed a field campaign to investigate the radiative effects of naturally derived aerosols in the Southern Hemisphere, yielding data that will reduce uncertainty in the calculation of climate forcing by aerosols.

### **Key FY 1998 Activities**

- ❖ Characterize the climate-change forcing elements: Provide a better quantification of the role of tropospheric ozone in altering the Earth's radiation budget.
- ❖ Help guide the rehabilitation of the ozone layer: Lead the 1998 Ozone Assessment for the Montreal Protocol on the United Nations. Provide scientific input to the assessments of trends in ozone and ozone-depleting substances, the understanding of ozone-depleting processes, and predictions of the recovery of the ozone layer in the next century.
- ❖ Provide the scientific basis for improved air quality: Describe the origin of high ozone levels in rural areas, where crop and forest damage are of growing concern. Help lead and contribute to a series of critical review scientific papers that will cover the science of regional ozone production and will lead to an assessment for better managing the Nation's air quality.
- ❖ Develop better models for climate prediction: Help lay the groundwork for an improved understanding of the radiation science in climate models, which will provide insight to the climate predictions contained in the year-2000 assessment by the IPCC.
- ❖ Ensure a long-term climate record: Strengthen on-going climate record observations to prepare for year-2000 research information needs and for outyear assessments of climate variability.

**Key Performance Measures**

|   | 1994 | 1995 | 1996 | 1997 | 1998 |
|---|------|------|------|------|------|
| Operational ozone stations to measure tropospheric ozone trends for greenhouse gases (#)  | 1    | 1    | 1    | 2    | 2    |
| Commercially viable CFC substitutes evaluated for greenhouse warming potential (%)  | 0    | 25   | 50   | 50   | 100  |
| Commercially viable CFC substitutes evaluated for ozone depletion potential   | 0    | 25   | 50   | 50   | 100  |
| Completion of documenting the turnover of ozone-depleting gases to verify the effect of global policy actions   | N/A  | N/A  | N/A  | 40   | 100  |
| Completion of initial state of science assessment of rural ozone chemistry (%)  | 0    | 10   | 25   | 50   | 75   |
| Completion of upgrade and operation of early detection of air quality stations  | -    | 0    | 20   | 30   | 50   |
| Inventory the NOAA research that will contribute to the Year-2000 IPCC scientific assessment of climate change and provide this information to IPCC planning (% completion) | N/A  | N/A  | N/A  | 25   | 100  |

| <i>Dollars in Thousands</i>                                  | Current Avail.<br>FY 1997 |               | FY 1998 Pres. Req. |               | Increase/Decrease |              |
|--|---------------------------|---------------|--------------------|---------------|-------------------|--------------|
|  | FTE                       | Amount        | FTE                | Amount        | FTE               | Amount       |
| <b>ACTIVITY REQUEST</b>                                      |                           |               |                    |               |                   |              |
| <b>Predict and Assess Decadal-to-Centennial Change</b>       |                           |               |                    |               |                   |              |
| National Ocean Service                                       | 0                         | 0             | 0                  | 0             | 0                 | 0            |
| Oceanic and Atmospheric Research                             | 307                       | 67,394        | 307                | 69,788        | 0                 | 2,394        |
| National Weather Service                                     | 55                        | 8,189         | 55                 | 8,189         | 0                 | 0            |
| National Environmental Satellite, Data & Information Service | 0                         | 3,219         | 0                  | 3,219         | 0                 | 0            |
| Program Support  | 76                        | 5,170         | 76                 | 5,214         | 0                 | 44           |
| Construction   | 0                         | 1,052         | 0                  | 520           | 0                 | (532)        |
| Fleet Modernization, Shipbuilding &                          | 0                         | 2,385         | 0                  | 3,700         | 0                 | 1,315        |
| <b>Total Predict and Assess Decadal-to-Centennial Change</b> | <b>438</b>                | <b>87,409</b> | <b>438</b>         | <b>90,630</b> | <b>0</b>          | <b>3,221</b> |

| <i>Dollars in Thousands</i>                                  | Current Avail.<br>FY 1997 |               | FY 1998 Pres. Req. |               | Increase/Decrease |              |
|--|---------------------------|---------------|--------------------|---------------|-------------------|--------------|
|  | FTE                       | Amount        | FTE                | Amount        | FTE               | Amount       |
| <b>GOAL BASED</b>  |                           |               |                    |               |                   |              |
| <b>Predict and Assess Decadal-to-Centennial Change</b>       |                           |               |                    |               |                   |              |
| Characterize Global Climate Forcing Agents                   | 66                        | 9,601         | 66                 | 9,709         | 0                 | 108          |
| Understand the Role of Oceans in Global Change               | 155                       | 26,147        | 155                | 26,354        | 0                 | 207          |
| Guide the Rehabilitation of the Ozone Layer                  | 42                        | 7,183         | 42                 | 7,291         | 0                 | 108          |
| Provide Prediction, Assessment, & Human Impact Info.         | 40                        | 7,498         | 40                 | 8,653         | 0                 | 1,155        |
| Ensure a Long-Term Climate Record                            | 75                        | 20,085        | 75                 | 19,901        | 0                 | (184)        |
| Provide the Scientific Basis for Improved Air Quality        | 0                         | 3,034         | 0                  | 3,034         | 0                 | 0            |
| GLOBE  | 4                         | 6,000         | 4                  | 7,000         | 0                 | 1,000        |
| Infrastructure   | 56                        | 7,861         | 56                 | 8,688         | 0                 | 827          |
| <b>Total Predict and Assess Decadal-to-Centennial Change</b> | <b>438</b>                | <b>87,409</b> | <b>438</b>         | <b>90,630</b> | <b>0</b>          | <b>3,221</b> |



# Promote Safe Navigation

Total Request \$84,690,000

## Vision

By 2005, merchant ships, fishing vessels and recreational boats will safely ply our coastal waters, electronically guided by space-based navigation and advanced information technologies. NOAA will revolutionize U.S. navigation, mapping and surveying and assist commercial shipping in moving increased cargoes safely and efficiently. NOAA will provide a precise satellite derived reference system as the basis for the Nation's geographical positioning needs.

## Challenge

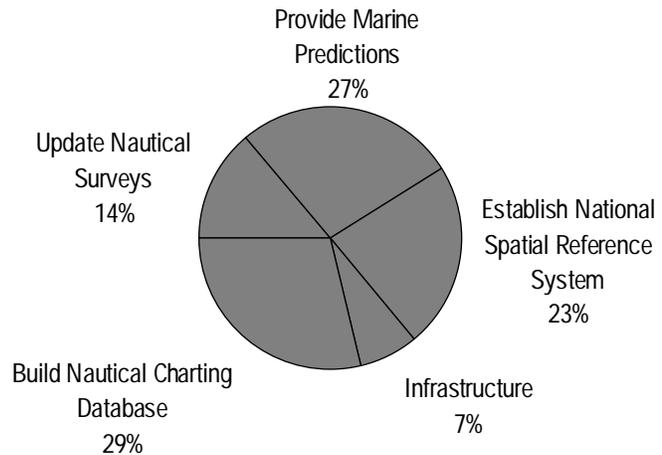
Ships have doubled in length, width and draft in the last 50 years and seagoing commerce has tripled, leading to increased risk in the Nation's ports. Greater dependence on foreign oil has increased the potential for disaster due to spills. From 1980 to 1988, tankers in the U.S. were involved in 936 moving accidents, 55 fires and explosions, and 95 deaths. Navigation tools must be modernized, as 60% of NOAA's nautical charting data were obtained before 1940 with obsolete methods. Two-thirds of the data used for tidal predictions are more than 40 years old. The existing coordinate reference system must be renovated to provide the higher accuracy and accessibility available from the Global Positioning System (GPS).

## Implementation Strategy.

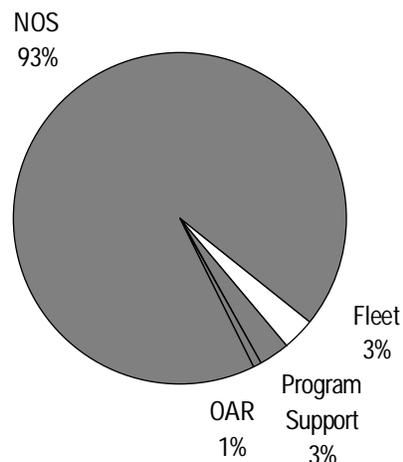
Objectives of this goal are to:

- ❖ Build, maintain and deliver a digital nautical charting database to underpin new electronic navigational systems which integrate satellite positioning, tidal heights and currents, radars and sonars, and navigational aids.
- ❖ Update nautical surveys of the Nation's coastlines and coastal oceans using full-bottom coverage technologies.
- ❖ Install measurement and communication systems to provide mariners with real-time observations and forecasts of water levels, tides and currents, and weather conditions in ports.

## Strategic Plan Objectives



## Participation by Activity



- ❖ Transform the obsolete geodetic reference frame into a GPS-based system of monumented marks and continuously operating reference stations (CORS) to support the digital revolution in mapping, charting and surveying.
- ❖ Provide modern aeronautical navigation information.

### **Benefits**

New electronic and space-based technologies promise to reduce maritime transportation risks, enhance environmental protections, and heighten the competitiveness of the shipping industry. A modernized GPS-based geodetic reference network using Federal standards will maximize the economic benefit of positioning investments. Nautical charting, coastal zone geographic information systems, precision agriculture, intelligent highway vehicle systems, and other uses of the Nation's annual investment of \$7 billion in spatial data depend upon convenient access to a GPS-based reference system.

### **FY 1996 Accomplishments**

During FY 1996, NOS:

- ❖ Produced 235 new editions of nautical charts, seven new editions of Coast Pilot volumes, and 14,682 new aeronautical charts and associated products.
- ❖ Implemented a "just-in-time" delivery system for applying new hydrographic survey data to new nautical chart editions. This reduced the data-to-chart time from years to less than 6 months.
- ❖ Acquired and processed data from 50 hydrographic surveys and two airborne laser hydrographic surveys.
- ❖ Installed a demonstration Physical Oceanographic Real Time System (PORTS) in San Francisco Bay, and evaluated a water level forecasting component of PORTS for Tampa Bay.
- ❖ Produced the 1997 U.S. Tide Tables and provided them on CD-ROM for private printing and distribution.
- ❖ Implemented an extension of the Coastal Forecast System (CFS) East Coast ocean model into the Gulf of Mexico.
- ❖ Installed 92 horizontal Federal Base Network (FNB) stations and 61 vertical FNB stations, and 47 Continuously Operating Reference Stations.
- ❖ Developed a GEOID96 model to support direct conversion between NAD83 GPS ellipsoidal heights and NAVD88 orthometric heights, allowing GPS to acquire elevations.

### **Key FY 1998 Activities**

- ❖ Complete installation of three PORTS, including Houston-Galveston, San Francisco and New York Harbor.
- ❖ Continue to reduce the backlog of hydrographic surveys and use this data to update nautical charts and the digital nautical database.
- ❖ Improve the ability to measure heights using GPS, resulting in more accurate tide measurements and enabling larger ships to pass safely into our Nation's ports.
- ❖ Continue development of the National Spatial Reference System by increasing the number of reference points in the system and bringing more GPS CORS on line.

**Key Performance Measures**

|   | 1994 | 1995 | 1996 | 1997 | 1998 |
|---|------|------|------|------|------|
| Nautical chart suite updated (%)  | 23   | 20   | 23   | 28   | 35   |
| % critical area survey backlog reduced (43,000 SNM backlog)<br>Cumulative reduction | 2    | 6    | 9    | 12   | 16   |
| % National Water Level Observation Network modernized (cum)                         | 55   | 65   | 70   | 75   | 80   |
| % of National Spatial Reference System (cumulative complete)                        | 20   | 42   | 53   | 58   | 65   |
| Digital nautical database available   |      |      |      |      |      |
| Cumulative % raster charts  | 15   | 36   | 100  | 100  | 100  |
| Cumulative % vector charts  | N/A  | N/A  | 1    | 5    | 25   |
| % aeronautical charts/products revised on schedule                                  | 100  | 100  | 100  | 100  | 100* |

\* **Note:** The Inspectors General of the Departments of Commerce and Transportation completed a study of NOAA's Office of Aeronautical Charting and Cartography (AC&C) to make recommendations on where this function should reside. The report recommended transferring the function to the FAA. The President's FY 1998 Budget includes funding for AC&C in the FAA's budget, but proposes that this transfer be accomplished in a two stage process. In FY 1998, NOAA will perform the work on a reimbursable basis with the FAA. In FY 1999, both the funding and the FTE required for conducting the work will be fully assumed by the FAA.

| <i>Dollars in Thousands</i>          | Current Avail.<br>FY 1997 |               | FY 1998 Pres. Req. |               | Increase/Decrease |                |
|--------------------------------------|---------------------------|---------------|--------------------|---------------|-------------------|----------------|
|                                      | FTE                       | Amount        | FTE                | Amount        | FTE               | Amount         |
| <b>ACTIVITY REQUEST</b>              |                           |               |                    |               |                   |                |
| <b>Promote Safe Navigation</b>       |                           |               |                    |               |                   |                |
| National Ocean Service               | 866                       | 86,380        | 806                | 78,449        | (60)              | (7,931)        |
| Oceanic and Atmospheric Research     | 0                         | 389           | 0                  | 389           | 0                 | 0              |
| Program Support                      | 61                        | 3,117         | 61                 | 3,068         | 0                 | (49)           |
| Construction                         | 0                         | 646           | 0                  | 183           | 0                 | (463)          |
| Fleet Modernization, Shipbuilding &  | 2                         | 1,337         | 2                  | 2,601         | 0                 | 1,264          |
| <b>Total Promote Safe Navigation</b> | <b>929</b>                | <b>91,869</b> | <b>869</b>         | <b>84,690</b> | <b>(60)</b>       | <b>(7,179)</b> |

| <i>Dollars in Thousands</i>                 | Current Avail.<br>FY 1997 |               | FY 1998 Pres. Req. |               | Increase/Decrease |                |
|---|---------------------------|---------------|--------------------|---------------|-------------------|----------------|
|   | FTE                       | Amount        | FTE                | Amount        | FTE               | Amount         |
| <b>GOAL BASED</b>                           |                           |               |                    |               |                   |                |
| <b>Promote Safe Navigation</b>              |                           |               |                    |               |                   |                |
| Build Nautical Charting Database            | 106                       | 16,450        | 175                | 24,950        | 69                | 8,500          |
| Update Nautical Surveys                     | 80                        | 11,860        | 80                 | 11,775        | 0                 | (85)           |
| Provide Marine Predictions                  | 371                       | 28,213        | 371                | 23,190        | 0                 | (5,023)        |
| Establish National Spatial Reference System | 197                       | 20,167        | 197                | 19,159        | 0                 | (1,008)        |
| Provide Modern Aeronautical Charts/Products | 129                       | 10,400        | 0                  | 0             | (129)             | (10,400)       |
| Infrastructure                              | 46                        | 4,779         | 46                 | 5,616         | 0                 | 837            |
| <b>Total Promote Safe Navigation</b>        | <b>929</b>                | <b>91,869</b> | <b>869</b>         | <b>84,690</b> | <b>(60)</b>       | <b>(7,179)</b> |



# Build Sustainable Fisheries

Total Request \$331,993,000

## Vision

NOAA's vision for the next decade is to increase greatly the Nation's wealth and quality of life through sustainable fisheries that support fishing industry jobs, safe and wholesome seafood and recreational opportunities.

## Challenge

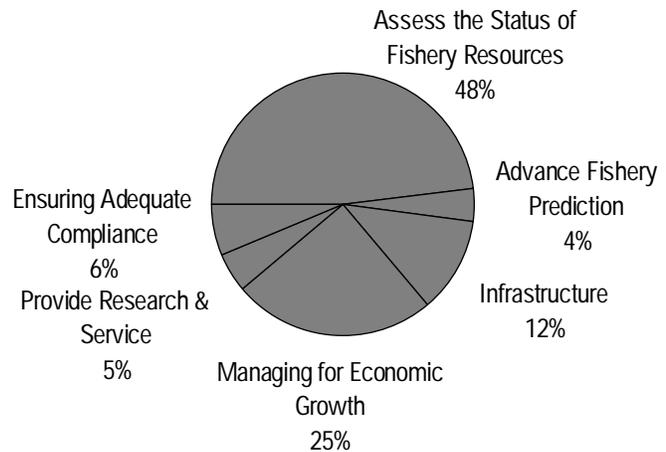
Billions of dollars in economic growth, thousands of jobs and countless recreational fishing opportunities are being wasted as a result of overfishing and overcapitalization in commercial and recreational fisheries. While many fisheries are well managed and producing positive benefits, others are severely depleted, and must be restored to realize their long-term potential. For example, fishing effort in the historically important New England groundfish fishery has been severely constrained due to the collapse of stocks. Transboundary resources can be especially vulnerable as they require international cooperation to achieve effective conservation and management. U.S. fisheries are troubled by bycatch, including juvenile and protected marine species, and by controversial allocation decisions among elements of fishing industries. Uncertainty in scientific information makes management decisions difficult.

## Implementation Strategy

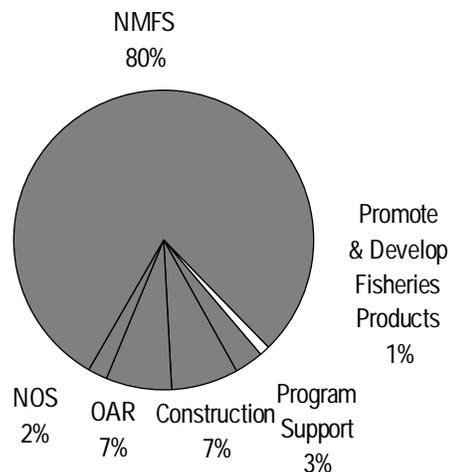
Objectives of this goal are to:

- ❖ Assess the status of fishery resources, through stock assessments and population dynamics research, to improve the scientific basis for policy decisions.
- ❖ Advance fishery predictions through research and applications.
- ❖ Manage for economic growth and sustainable fisheries by working with Fishery Management Councils, foreign nations and others to develop plans for reducing excessive fishing and capital investment.

## Strategic Plan Objectives



## Participation by Activity



- ❖ Ensure adequate and voluntary compliance with fishery regulations.
- ❖ Provide research and services for fishery-dependent industries to maximize the potential benefits from the Nation's marine resources.

### **Benefits**

Rebuilding and maintaining fisheries will promote the economic and biologic sustainability of U.S. fishing resources, and assist the commercial fishing industry in becoming more competitive internationally. NOAA estimates that restoring fisheries may add as much as \$2.9 billion in potential net value to the U.S. economy as overfished stocks recover and over-capitalization is reduced. A potential \$25 billion total impact on the national economy (direct, indirect and induced) will develop thousands of new jobs. Along with economic gains, this activity will enhance recreational opportunities, reduce our seafood trade deficit, improve the management of fisheries, and save lives by eliminating the dangerous and wasteful race for the fish.

### **FY 1996 Accomplishments**

During FY 1996, NOAA continued to make progress toward rebuilding and maintaining the health of U.S. fisheries. Most significantly, NOAA:

- ❖ Conducted numerous stock assessments, area surveys and species technical reviews to improve management decisions and fishery catch quotas.
- ❖ Reduced accidents and property loss, increased the economic value of the resource by making fresh product available for longer period, and reduced bycatch of halibut in the \$180 million Alaskan halibut/sablefish fishery by implementing controlled access measures.
- ❖ Began implementation of Amendment 7 to the Northeast Multi-species FMP to rebuild stocks and stop the decline of cod, haddock and yellowtail flounder.
- ❖ Developed a World Wide Web Data Dissemination System to allow interactive access to NOAA fishery statistics.
- ❖ Launched the Fix-It Notice Program that promotes partnership in protecting resources by giving first-time offenders an opportunity to fix minor technical problems without the threat of a penalty.
- ❖ Uncovered a massive fraud case involving a major fishing operation. Proposed penalties include permit revocations and more that \$5 million in penalties.
- ❖ Developed a Bycatch Plan to guide bycatch-related research and management for the next decade. The Plan will be available in 1997.

- ❖ Continued to support the Bering Sea Fisheries Oceanography Coordinated Investigations (FOCI) program, which now enables three-year advance predictions of pollock stocks in this \$1 billion industry.
- ❖ Initiated, through research, rapid and highly specific tests for detecting pathogenic potentially lethal bacteria in food products, including seafood.

### **Key FY 1998 Activities**

- ❖ Implement new provisions of the recently reauthorized Magnuson-Stevens Fishery Conservation and Management Act, including: developing bycatch reduction models and strategies; revising all 39 existing Fishery Management Plans to include new provisions; incorporating Essential Fish Habitat requirements; completing reports and studies; establishing advisory panels; and promulgating new regulations. The eight Regional Fishery Management Councils also face new requirements and changes in membership.
- ❖ Continue to collect resource survey data with an emphasis on stocks of unknown or uncertain status, and on high priority stocks such as New England groundfish and Alaskan pollock. Data collection will be accomplished with NOAA platforms or through charter arrangements for vessels, and through satellite remote sensing and data communication capabilities.
- ❖ Improve the prediction of long-term potential yields by applying fisheries oceanography research leading to the development of better ecosystem-based models for fisheries forecasting. Modeling efforts will be focused on high-priority regions, and some funds will be leveraged through the GLOBEC Program with the National Science Foundation. New research also will focus on the causes and potential mitigation of harmful algal blooms.
- ❖ Improve the analytical capability to predict and monitor the economic and social benefits and costs of fisheries management decisions, and support a National Academy of Sciences Study, required by the Congress, to examine the effects of Individual Transferable Quotas (ITQs) and Community Development Quotas (CDQs) in the context of fisheries management. NOAA will leverage economic analysis expertise available in several Sea Grant Universities to conduct important fisheries cost earnings surveys, and continue to implement its 10-year Fisheries Statistics Strategic Plan.
- ❖ Provide effective fisheries monitoring, surveillance and compliance with regulations, and continue to use and examine applications of satellite capabilities for fisheries enforcement purposes. NOAA will continue to develop enforcement partnerships with other Federal agencies, four states and at least five treaty tribes.
- ❖ Continue to support aquaculture research, including a joint project with Japan on flounder aquaculture.

**Key Performance Measures**

|  | 1994 | 1995 | 1996 | 1997 | 1998 |
|--|------|------|------|------|------|
| % of stocks assessed (of 231 identified)                                     | 71   | 74   | 74   | 75   | 75   |
| % completion of information technology procurement/operations                | 17   | 53   | 74   | 85   | 90   |
| # models/syntheses delivered for fisheries oceanography studies              | -    | -    | 2    | 3    | 1    |
| # Fishery Management Plans with access controls implemented (of 39 FMPs)     | 17   | 19   | 24   | 25   | 25   |
| <b>Northeast multispecies groundfish fishery</b>                             |      |      |      |      |      |
| # of vessels removed   | N/A  | N/A  | 11   | 76   | *    |
| # of fishing permits retired   | N/A  | N/A  | 26   | 180  | *    |
| <b>Northwest salmon fishery</b>  |      |      |      |      |      |
| # of fleets using vessel monitoring systems for spatial/temporal regulations | N/A  | 1    | 3    | 3    | 3    |

\* **Note:** No funds requested in FY 1998 for vessel and permit buyouts and direct economic assistance to fishermen.

| <i>Dollars in Thousands</i>              | Current Avail.<br>FY 1997 |                | FY 1998 Pres. Req. |                | Increase/Decrease |              |
|--|---------------------------|----------------|--------------------|----------------|-------------------|--------------|
|  | FTE                       | Amount         | FTE                | Amount         | FTE               | Amount       |
| <b>ACTIVITY REQUEST</b>                  |                           |                |                    |                |                   |              |
| <b>Build Sustainable Fisheries</b>       |                           |                |                    |                |                   |              |
| National Ocean Service                   | 14                        | 7,350          | 14                 | 7,350          | 0                 | 0            |
| National Marine Fisheries Service        | 1,942                     | 248,728        | 1,954              | 256,289        | 12                | 7,561        |
| Oceanic and Atmospheric Research         | 10                        | 27,682         | 10                 | 23,498         | 0                 | (4,184)      |
| Program Support                          | 196                       | 10,759         | 196                | 10,921         | 0                 | 162          |
| Construction                             | 10                        | 26,099         | 10                 | 23,033         | 0                 | (3,066)      |
| Fleet Modernization, Shipbuilding &      | 15                        | 4,278          | 10                 | 5,522          | (5)               | 1,244        |
| Fishing Vessel Obligation Guarantee      | 0                         | 250            | 0                  | 238            | 0                 | (12)         |
| Promote and Develop Fisheries Products   | 4                         | 381            | 4                  | 4,000          | 0                 | 3,619        |
| Fishing Vessel and Gear Damage Fund      | 2                         | 200            | 0                  | 0              | (2)               | (200)        |
| Fishermen's Contingency Fund             | 2                         | 1,000          | 2                  | 953            | 0                 | (47)         |
| Foreign Fishing Observer Fund            | 0                         | 196            | 0                  | 189            | 0                 | (7)          |
| <b>Total Build Sustainable Fisheries</b> | <b>2,195</b>              | <b>326,923</b> | <b>2,200</b>       | <b>331,993</b> | <b>5</b>          | <b>5,070</b> |

| <i>Dollars in Thousands</i>              | Current Avail.<br>FY 1997 |                | FY 1998 Pres. Req. |                | Increase/Decrease |              |
|--|---------------------------|----------------|--------------------|----------------|-------------------|--------------|
|  | FTE                       | Amount         | FTE                | Amount         | FTE               | Amount       |
| <b>GOAL BASED</b>                        |                           |                |                    |                |                   |              |
| <b>Build Sustainable Fisheries</b>       |                           |                |                    |                |                   |              |
| Assess the Status of Fishery Resources   | 1,358                     | 164,687        | 1,358              | 160,241        | 0                 | (4,446)      |
| Advance Fishery Prediction               | 16                        | 14,012         | 16                 | 12,890         | 0                 | (1,122)      |
| Managing for Economic Growth             | 382                       | 73,972         | 392                | 84,620         | 10                | 10,648       |
| Ensuring Adequate Compliance             | 171                       | 16,500         | 171                | 18,200         | 0                 | 1,700        |
| Provide Research and Service             | 47                        | 15,811         | 47                 | 15,761         | 0                 | (50)         |
| Infrastructure                           | 221                       | 41,941         | 216                | 40,281         | (5)               | (1,660)      |
| <b>Total Build Sustainable Fisheries</b> | <b>2,195</b>              | <b>326,923</b> | <b>2,200</b>       | <b>331,993</b> | <b>5</b>          | <b>5,070</b> |



# Recover Protected Species

Total Request \$69,719,000

## Vision

NOAA's vision is to conserve marine species and to recover those in danger of extinction. By 2005, NOAA will be on the road to recovering every marine species at risk and maintaining the healthy marine ecosystems upon which they depend.

## Challenge

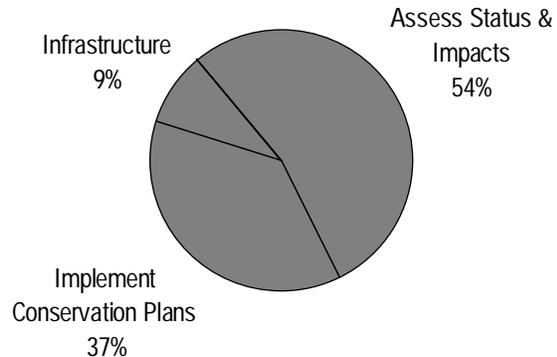
Marine resources contribute billions of dollars to the Nation's economy. However, many commercial and recreational activities contribute to stress on marine species. Many populations of marine organisms are depleted or declining due to human activity in marine ecosystems or to unknown causes. For example, west coast salmon and steelhead populations are at risk due to a combination of factors including habitat loss and commercial overexploitation. Despite protective measures, fishing-related mortality continues to threaten whales and marine turtles in U.S. waters. Several seal and sea lion populations in Alaska are declining rapidly, and the causes are uncertain. While many recovery plans have been developed, none have been implemented fully and plans still are needed for many species. The desired outcome is to recover protected species in danger of extinction in a manner compatible with the sustainable use of marine resources.

## Implementation Strategy

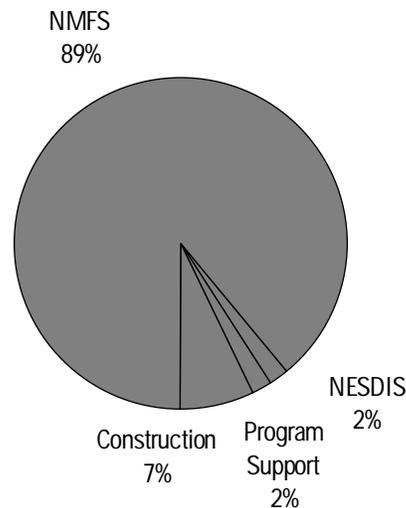
Objectives of this goal are to:

- ❖ Assess the status of, and impacts to, protected species. Information is needed to better focus management actions, limit the scope of restrictions, and promote the recovery of all protected species.
- ❖ Develop and implement conservation and recovery plans for depleted marine mammals and endangered and threatened species. This will be done in part through developing new partnerships with state and private sectors. Technologies and measures will be developed to reduce or avoid detrimental interactions between marine species and human activities.

Strategic Plan Objectives



Participation by Activity



## **Benefits**

Through conservation of the Nation's living marine resources, NOAA will enhance economic and cultural opportunities for future generations. The existence of the Marine Mammal Protection Act, the Endangered Species Act and other legislation provides a clear indication of public support for strong efforts to conserve living marine resources. This effort will enable the preservation of marine biodiversity by balancing the utilization of natural resources with the management of protected species. Recovering species, and avoiding the further decline of others, will contribute to the overall health and understanding of marine ecosystems. Improved science will lead to better long-term management and conservation strategies.

## **FY 1996 Accomplishments**

NOAA, working with partner agencies and affected parties, has continued to design and implement measures to improve the status of endangered species during FY 1996. NOAA has addressed high-profile issues associated with the northern right whale, incidental take of marine mammals in commercial fisheries, protection of Kemp's ridley sea turtles, and listing of Pacific salmonids. Most significantly, NOAA:

- ❖ Established an expert working group to provide advice on the effectiveness of conservation measures for Kemp's ridley sea turtles at sea and on the nesting beach. As a result of recommendations in FY 1996, NOAA is strengthening TED requirements, and has increased cooperation with Mexico for TED uses and to maximize hatchling production of wild turtles on the nesting beach.
- ❖ Initiated four marine mammal take reduction plans, which will be finalized during 1997, to improve the conservation of marine mammals in the Atlantic and Pacific oceans.
- ❖ Convened a Science Advisory Panel to review and advise on Snake River salmon recovery actions, and conducted hundreds of ESA Section 7 and 10 consultations to ensure proposed actions do not further jeopardize salmon survival.
- ❖ Established a cooperative conservation program agreement under ESA Section 6 with the Commonwealth of Massachusetts.
- ❖ Completed status reviews for salmon stocks and updated 50 marine mammal strategic stocks assessments.
- ❖ Provided specialized support, with the Navy and the states of Georgia and Florida, to reduce ship strikes and fisheries mortality on highly endangered Atlantic right whales.

**Key FY 1998 Activities:**

- ❖ Accelerate habitat conservation planning for at-risk salmon stocks and expand support for state conservation programs to protect Pacific salmon in California, Oregon and Washington.
- ❖ Undertake actions required to address increased responsibilities and workload associated with harvest, hatcheries, habitat and hydropower activities in response to additional salmon and steelhead listings along the West Coast.
- ❖ Increase involvement in and complete more Habitat Conservation Plans in response to Administration and landowner interest in cooperatively addressing salmon habitat conservation; improve state/Federal cooperation through technical and policy support in state conservation programs; and assist Federal interagency efforts to take an ecosystem approach to multispecies management to better address threats to salmonids.
- ❖ Expand recovery actions for endangered Kemp's Ridley turtles by increasing protection at the nesting beach in Mexico and in U.S. waters.
- ❖ Strengthen the Atlantic right whale recovery program by providing adequate warnings to prevent ship strikes and long-term monitoring to determine habitat use and migratory pathways.
- ❖ Restore the highly endangered Hawaiian monk seal to former rookeries on Midway Island.
- ❖ Establish cooperative conservation program agreements under ESA Section 6 with additional states, including Alaska, California and Washington.

**Key Performance  
Measures**

|  | 1994 | 1995 | 1996 | 1997 | 1998 |
|--|------|------|------|------|------|
| # recovery plans developed   | 9    | 11   | 13   | 23   | 25   |
| # recovery plans priority activities implemented (annual)                | 0    | 8    | 8    | 8    | 8    |
| # species with population status improved (annual)                       | 3    | 4    | 11   | 12   | 16   |
| # species status reviews used to evaluate conservation programs (annual) | 2    | 3    | 3    | 11   | 7    |
| # investigations on hortality of protected species (annual)              | 8    | 9    | 11   | 7    | 10   |
| # cooperative conservation programs implemented (cum)                    | 0    | 3    | 4    | 8    | 10   |

| <i>Dollars in Thousands</i>                                  | Current Avail.<br>FY 1997 |               | FY 1998 Pres. Req. |               | Increase/Decrease |              |
|--|---------------------------|---------------|--------------------|---------------|-------------------|--------------|
|  | FTE                       | Amount        | FTE                | Amount        | FTE               | Amount       |
| <b>ACTIVITY REQUEST</b>                                      |                           |               |                    |               |                   |              |
| <b>Recover Protected Species</b>                             |                           |               |                    |               |                   |              |
| National Marine Fisheries Service                            | 365                       | 54,728        | 410                | 62,325        | 45                | 7,597        |
| Oceanic and Atmospheric Research                             | 0                         | 340           | 0                  | 340           | 0                 | 0            |
| National Environmental Satellite, Data & Information Service | 0                         | 1,202         | 0                  | 1,202         | 0                 | 0            |
| Program Support  | 21                        | 1,227         | 21                 | 1,245         | 0                 | 18           |
| Construction   | 1                         | 5,202         | 1                  | 4,607         | 0                 | (595)        |
| <b>Total Recover Protected Species</b>                       | <b>387</b>                | <b>62,699</b> | <b>432</b>         | <b>69,719</b> | <b>45</b>         | <b>7,020</b> |

| <i>Dollars in Thousands</i>            | Current Avail.<br>FY 1997 |               | FY 1998 Pres. Req. |               | Increase/Decrease |              |
|--|---------------------------|---------------|--------------------|---------------|-------------------|--------------|
|  | FTE                       | Amount        | FTE                | Amount        | FTE               | Amount       |
| <b>GOAL BASED</b>                      |                           |               |                    |               |                   |              |
| <b>Recover Protected Species</b>       |                           |               |                    |               |                   |              |
| Assess Status and Impacts              | 347                       | 37,550        | 347                | 37,777        | 0                 | 227          |
| Implement Conservation Plans           | 18                        | 18,380        | 63                 | 25,750        | 45                | 7,370        |
| Infrastructure                         | 22                        | 6,769         | 22                 | 6,192         | 0                 | (577)        |
| <b>Total Recover Protected Species</b> | <b>387</b>                | <b>62,699</b> | <b>432</b>         | <b>69,719</b> | <b>45</b>         | <b>7,020</b> |



# Sustain Healthy Coasts

Total Request \$212,241,000

## Vision

By 2005, the Nation's coasts will have more productive and diverse habitats for fish and wildlife, and cleaner coastal waters for recreation and the production of seafood. Coastal communities will have thriving, sustainable economies based on well-planned development and healthy coastal ecosystems.

## Challenge

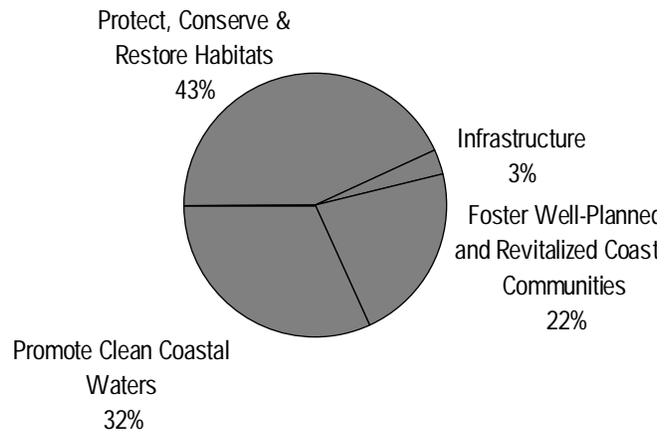
Over half of the U.S. population lives on the 10 percent of land area defined as coastal. Between one-third and one-half of U.S. jobs are located in coastal areas, and one-third of the Nation's gross national product is produced there. Coastal areas provide essential habitats for the majority of commercially valuable marine species. Despite significant progress to develop the technology, information and management systems that foster sustainable economies and conservation of coastal resources, rapid population growth and increasing demands for recreation and economic development in many coastal areas have degraded natural resources and led to declines in both environmental integrity and general productivity. The closure of beaches and harvesting areas is evidence that declines in the health of coastal environments threaten businesses and human health. Maintaining the health, productivity and biodiversity of coastal ecosystems is essential to the sustainable development of coastal economies and the future welfare of the Nation.

## Implementation Strategy

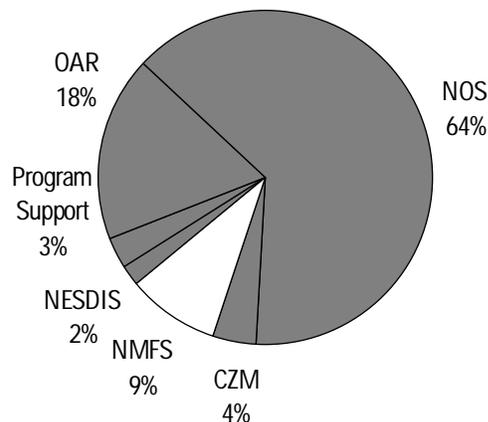
Objectives of this goal are to:

- ❖ Protect, conserve and restore coastal habitats and their biodiversity.
- ❖ Promote clean coastal waters to sustain living marine resources and ensure safe recreation, healthy seafood and economic vitality.
- ❖ Foster well-planned and revitalized coastal communities that sustain coastal economies, are

## Strategic Plan Objectives



## Participation by Activity



compatible with the natural environment, minimize the risks from natural hazards, and provide access to coastal resources for the public's use and enjoyment.

### **Benefits**

Improved understanding of the way coastal ecosystems function, coupled with an ability to predict responses of ecosystems to human activities and take appropriate action, are keys to an approach that ensures that the Nation's coastal ecosystems are managed for long-term benefit. This goal addresses the practical needs and concerns of resource managers, as well as strengthening the watershed and regional management frameworks provided by Federal-state partnerships such as the CZM program. An integrated program of monitoring, research, assessments, restoration, information dissemination, and resource management will provide the basis for the sustainable development of our coasts.

### **FY 1996 Accomplishments**

During FY 1996, NOAA:

- ❖ Unveiled the Final Management Plan for the Florida Keys National Marine Sanctuary.
- ❖ Provided technical and scientific assistance to the Coast Guard at 70 oil and chemical spills, including major spills off Rhode Island, Galveston, Honolulu and Portland, Me.
- ❖ Increased the pace of coastal habitat restoration, with 50 projects benefiting 40,000 acres, in partnership with Federal, state and local agencies, industry and non-governmental organizations.
- ❖ Completed the first strategic plan for NOAA's National Habitat Program, which sets the course for habitat protection, restoration, research and outreach for the next five years.
- ❖ Provided hardware at CoastWatch Nodes for ocean color products from the ADEOS/OCTS satellite, supporting improved fisheries management, hazard mitigation, and water quality management.
- ❖ Created a national policy on gravel mining, with emphasis on effects of riverbed extraction on Pacific salmon.
- ❖ Reviewed and sent, with the EPA, conditional approval findings to 27 of 29 states on Coastal Non-point Programs.
- ❖ Completed the first Nation-wide assessment of the spatial extent of toxic contaminants in sediments and bivalves in coastal waters. Survey data show high levels of toxics are found primarily near urban centers in estuarine areas and other coastal waters with restricted circulation.

- ❖ Documented the magnitude and extent of contaminants in heavily contaminated Boston Harbor.
- ❖ Developed databases and prepared graphical displays to relate information on natural resources, sediment contaminants and contamination sources and potential restoration projects for three watersheds (Newark Bay, San Francisco Bay, and Christina River).
- ❖ Initiated the San Francisco Bay Project to integrate its ecosystem management, natural hazards mitigation, and marine transportation activities.

**Key FY 1998 Activities:**

- ❖ South Florida Ecosystem Restoration Initiative: In FY 1998, NOAA will: 1) provide integrated coastal monitoring in Florida Bay and the Florida Keys National Marine Sanctuary; 2) continue to restore South Florida's living marine resources and coral reefs; and 3) determine causes of declines and effects of human actions on coastal resources.
- ❖ Clean Water Initiative: This Presidential environmental initiative is aimed at protecting communities from toxic pollution. NOAA is an important participant in the three year (1998-2000) Clean Water Initiative to: 1) make information more accessible to local communities about toxins in water; and 2) work with state and local governments to reduce the flow of toxic pollutants to Great Lakes and other coastal waters. NOAA's previous work on water quality issues with coastal states has produced strategies and programs that this Initiative will implement to keep coastal communities informed and decrease inputs of toxic pollutant runoff into coastal waters.
- ❖ Essential Fish Habitat: NOAA has new responsibilities under the Magnuson-Stevens Act of 1996 for identifying essential fish habitat and adding essential habitat elements into fishery management plans. These new responsibilities will require significant resources and attention in FY 1998.
- ❖ West Coast Salmon and Steelhead: NOAA will accelerate its participation in habitat watershed planning and management as an essential component of the overall recovery effort for salmon and steelhead species, and in fulfillment of responsibilities under the National Habitat Plan. The development of habitat conservation plans and the increase in Federal Energy Regulatory Commission relicensings on the West coast also will affect the recovery of these newly listed species.
- ❖ Marine and Coastal Protected Areas: NOAA will implement new management plans in the Florida Keys National Marine Sanctuary (NMS) and the Hawaii Humpback Whale NMS. In addition, new National Estuarine Research Reserve designations are expected in FY 1998.

**Key Performance Measures**

|   | 1994 | 1995 | 1996 | 1997  | 1998  |
|---|------|------|------|-------|-------|
| <b>Protection/restoration of coastal habitats:</b>                              |      |      |      |       |       |
| # Acres restored (cum)  | 2500 | 4000 | 7000 | 11000 | 26000 |
| # Acres restored (indiv)  | 2500 | 1500 | 3000 | 8000  | 15000 |
| # Damage cases settled  | 13   | 6    | 3    | 2     | 2     |
| # Comprehensive project reviews (cum)   | 1700 | 1500 | 1500 | 1500  | 1500  |
| # Interagency agreement projects to restore coastal habitat (cum)               | 4    | 5    | 9    | 16    | 20    |
| <b>% Resource protection systems completed:</b>                                 |      |      |      |       |       |
| Nat'l Marine Sanctuary System   | 29   | 29   | 29   | 29    | 29    |
| Nat'l Estuarine Research Reserve System   | 59   | 59   | 59   | 62    | 67    |
| State Coastal Nonpoint Prgms  | 0    | 0    | 48   | 83    | 83    |
| State Coastal Zone Mgt Prgms  | 83   | 83   | 83   | 89    | 94    |
| <b>% Fishery management plans with improved habitat elements:</b>               |      |      |      |       |       |
| 0   | 0    | 0    | 8    | 20    |       |
| <b>% Coastal ecosystems with inventories, databases, and assessments for:</b>   |      |      |      |       |       |
| Reducing risks from hazardous chemicals   | 2    | 5    | 10   | 15    | 20    |
| Characterizing the status of resources for the Nation's estuarine resource base | 10   | 12   | 18   | 20    | 23    |
| <b>% Coastal ecosystems with:</b>   |      |      |      |       |       |
| Toxic chemical levels and effects assessed                                      | 5    | 8    | 15   | 20    | 24    |
| Improved health indices   | 0    | 0.5  | 1    | 2     | 3     |
| <b># Tools improved and applied:</b>  |      |      |      |       |       |
| Risk assessment   | 0    | 1    | 1    | 0     | 0     |
| Monitoring and assessment   | 2    | 2    | 2    | 2     | 2     |
| Satellite-derived products  | 128K | 172K | 178K | 175K  | 185K  |
| Regional assessments with ecosystem models                                      | 0    | 4    | 1    | 2     | 0     |

| <i>Dollars in Thousands</i>                                  | Current Avail.<br>FY 1997 |                | FY 1998 Pres. Req. |                | Increase/Decrease |               |
|--|---------------------------|----------------|--------------------|----------------|-------------------|---------------|
|  | FTE                       | Amount         | FTE                | Amount         | FTE               | Amount        |
| <b>ACTIVITY REQUEST</b>                                      |                           |                |                    |                |                   |               |
| <b>Sustain Healthy Coasts</b>                                |                           |                |                    |                |                   |               |
| National Ocean Service                                       | 359                       | 109,546        | 359                | 136,087        | 0                 | 26,541        |
| National Marine Fisheries Service                            | 219                       | 18,240         | 219                | 19,650         | 0                 | 1,410         |
| Oceanic and Atmospheric Research                             | 44                        | 44,801         | 44                 | 37,680         | 0                 | (7,121)       |
| National Environmental Satellite, Data & Information Service | 0                         | 5,121          | 0                  | 4,921          | 0                 | (200)         |
| Program Support  | 97                        | 5,417          | 97                 | 5,498          | 0                 | 81            |
| Construction   | 0                         | 2,624          | 0                  | 605            | 0                 | (2,019)       |
| Coastal Zone Management Fund                                 | 49                        | 7,800          | 49                 | 7,800          | 0                 | 0             |
| <b>Total Sustain Healthy Coasts</b>                          | <b>768</b>                | <b>193,549</b> | <b>768</b>         | <b>212,241</b> | <b>0</b>          | <b>18,692</b> |

| <i>Dollars in Thousands</i>                             | Current Avail.<br>FY 1997 |                | FY 1998 Pres. Req. |                | Increase/Decrease |               |
|---|---------------------------|----------------|--------------------|----------------|-------------------|---------------|
|   | FTE                       | Amount         | FTE                | Amount         | FTE               | Amount        |
| <b>GOAL BASED</b>                                       |                           |                |                    |                |                   |               |
| <b>Sustain Healthy Coasts</b>                           |                           |                |                    |                |                   |               |
| Protect, conserve and restore habitats                  | 335                       | 86,140         | 335                | 90,985         | 0                 | 4,845         |
| Promote clean coastal waters                            | 306                       | 50,048         | 306                | 67,238         | 0                 | 17,190        |
| Foster well-planned and revitalized coastal communities | 30                        | 48,515         | 30                 | 47,110         | 0                 | (1,405)       |
| Infrastructure  | 97                        | 8,846          | 97                 | 6,908          | 0                 | (1,938)       |
| <b>Total Sustain Healthy Coasts</b>                     | <b>768</b>                | <b>193,549</b> | <b>768</b>         | <b>212,241</b> | <b>0</b>          | <b>18,692</b> |